

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
29 September 2005 (29.09.2005)

PCT

(10) International Publication Number  
**WO 2005/090171 A1**

(51) International Patent Classification<sup>7</sup>: B65D 5/20,  
5/28, 5/50, 5/42

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(21) International Application Number:  
PCT/US2005/008557

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(22) International Filing Date: 14 March 2005 (14.03.2005)

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ,  
TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA,  
ZM, ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
10/799,967 12 March 2004 (12.03.2004) US

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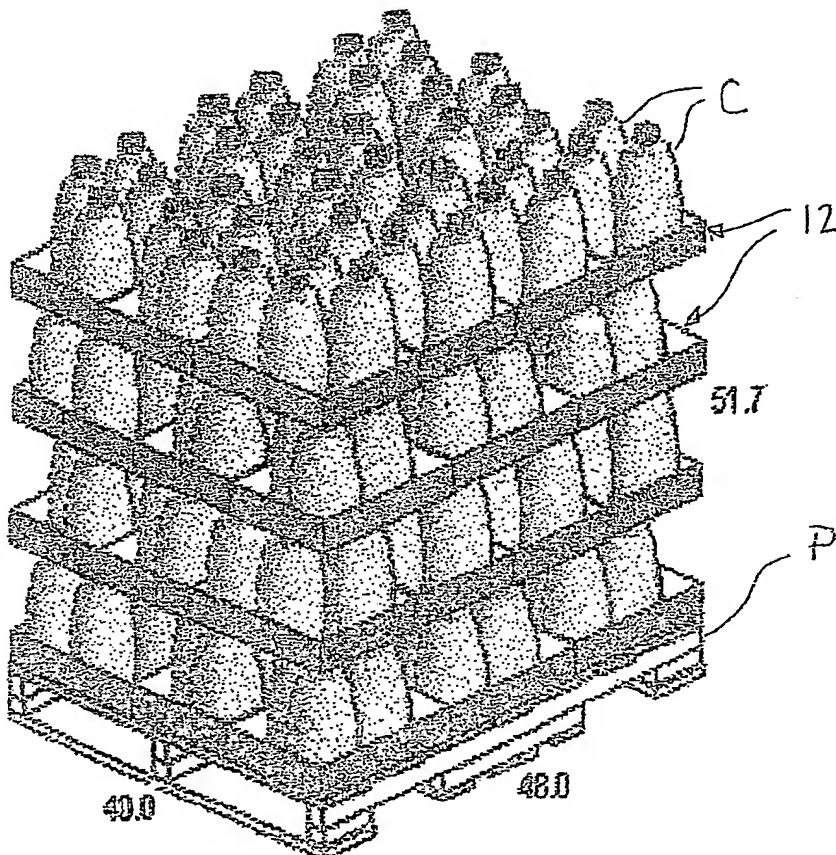
(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

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[Continued on next page]

(54) Title: STACKABLE SHIPPING AND DISPLAY BOX



(57) Abstract: An elongate, rectangular box (12, 14, 40, 60, 70, 90, 100) and method for packaging containers (C), wherein the box can be cross-stacked for stable stacking of the boxes, and optimizes utilization of pallet space. Containers (C) are placed in the box in nested, offset relationship in a parallelogram shaped arrangement, and in one embodiment interior corner panels (20, 21) extend angularly across two diagonally opposite corners of the box, defining an interior box shape closely conforming to the parallelogram-shaped arrangement of the containers. The corner panels may be cut from the side walls (18, 19) and folded inwardly and secured at a free edge (28) to an adjacent end wall (16, 17), defining openings (22, 23) in the side wall through which the containers are visible. Side wall segments (24, 25, 26) at the bottom and sides of the opening, in cooperation with the corner panels, retain the containers in place in the box. The box is especially suited for packaging four one-gallon containers.

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## STACKABLE SHIPPING AND DISPLAY BOX

### Technical Field:

This invention relates to packaging, and more particularly to a stackable shipping and display box.

### 5 Background Art:

Many products are shipped in cartons or boxes that enable the product to be displayed in the shipping box at the point of sale. These types of boxes are particularly suitable for products sold in club stores, where many products, e.g., juices, typically are packaged in one-gallon containers. Conventional boxes for handling one-gallon  
10 containers usually comprise full depth closed RSC's, although partial depth boxes or trays are sometimes used. A divider that extends between the containers normally is used in the partial depth trays to provide adequate strength. Further, conventional boxes for holding one-gallon containers are commonly designed for holding six containers, although some packages, such as those shown in figures 1 and 2, are  
15 designed for holding four containers, primarily due to weight concerns. These conventional boxes are square in plan view, with the one-gallon containers orthogonally oriented in side-by-side relationship to one another.

To facilitate handling, it is common practice to stack several layers of filled boxes on a pallet, and sometimes to stack two or more pallets high. Conventional  
20 square boxes are often column stacked, and typically require internal or external support to eliminate or reduce load on the bottles. Column stacking of the boxes is inherently unstable, and layer sheets, or slip sheets, may be employed between adjacent layers of boxes to improve the stability of the stacked boxes.

Moreover, the pallets used typically have dimensions of 48X40 inches, and the  
25 square boxes do not utilize the pallet space well, i.e., a plurality of the boxes placed in a layer either do not occupy the entire pallet space, or they overhang the pallet, depending upon how the boxes are oriented and how many are placed in a layer on the pallet. Conventional square boxes do not permit any arrangement of the boxes on a pallet that will result in the footprint of the area occupied by the boxes being substantially equal to

footprint of the area occupied by a layer of boxes is substantially the same as the area of the pallet surface. With the invention, eleven boxes holding forty-four containers can be placed in a layer on a 48X40 inch pallet, although it should be understood that these numbers can vary, depending upon the bottle diameter and footprint.

5        Additionally, empty containers, e.g., bottles, can be inverted and placed upside down in the box by the bottle manufacturer for shipment to a facility for filling the bottles. The shape of the box, including the angled corner panels, securely holds the inverted empty bottles in place even when some of the side walls have a reduced height to define openings through which the bottles are visible.

10        Further, the box of the invention, including the angled corner panels, can be made from a single unitary blank of corrugated board, and when loaded with four one-gallon containers of juice, for example, has a case weight less than 40 pounds. In an alternate embodiment, the angled corner panels can be formed from separate pieces inserted into the box.

15        The box of the invention is equally suitable for use with containers having a round cross-section or a non-round cross section, e.g., square.

#### **Brief Description of the Drawings:**

20        The foregoing, as well as other objects and advantages of the invention, will become apparent from the following detailed description taken in conjunction with the accompanying drawings, wherein like reference characters designate like parts throughout the several views, and wherein:

25        Figure 1 is a top perspective view of conventional partial depth square boxes or trays filled with four containers placed side-by-side in orthogonal relationship relative to one another and column-stacked on a pallet.

      Figure 2 is a top perspective view of a single prior art box conventionally filled with four containers disposed in side-by-side orthogonal relationship to one another, and showing an H-shaped divider in dot-and-dash lines.

30        Figure 3 is a top plan view depicting how conventional square boxes designed for holding four one-gallon containers occupy the space on a conventional 48X40 inch pallet.

Figure 17 is a top plan view of a blank for making the box of figure 16.

Figure 18 is a top plan view of a blank for making the inserts used in the box of figure 16.

Figure 19 is a top plan view of the box of figure 8, with containers having a square cross-section therein.

Figure 20 is a top perspective view of a fifth embodiment of the box of the invention, wherein the reduced height side walls are defined by cut-outs in full height panels forming those side walls.

Figure 21 is a top plan view of a blank for making the box of figure 20.

Figure 22 is a top perspective view of an alternate embodiment of a box incorporating the invention, wherein one end wall is cut away to produce an opening through which the containers are visible.

Figure 23 is a top perspective view showing a plurality of the boxes of figure 22 placed on a pallet, and showing how the footprint of the area occupied by the boxes is substantially the same as the area of the pallet surface.

#### **Description of the Preferred Embodiments:**

A conventional box of square shape designed for holding four one-gallon containers **C** is shown at 10 in figures 1-3. In accordance with conventional practice, the containers are placed in the box in orthogonally disposed side-by-side relationship to one another, and an H-shaped divider 11, shown in dot-and-dash lines, is placed in the box between the containers. Boxes filled with containers are typically stacked in layers on a pallet **P**, and as depicted in figures 1 and 2, the boxes are stacked on top of one another in columnar relationship. This arrangement is unstable, and layer sheets (not shown) are commonly placed between adjacent layers. Moreover, only nine boxes may be placed in a layer without producing pallet overhang, but this results in a substantial area of the pallet not being used.

The invention solves this problem, as depicted in figures 4-7, by making the boxes 12 rectangular in shape, with a greater length dimension **L** than width dimension **W**, and placing the containers **C** in the box so that they are in offset or staggered relationship, as seen best in figures 5 and 6. With this arrangement, the boxes may be

A blank **B<sub>1</sub>** for forming the box of figures 8 and 10 is shown in figure 9, and comprises a single unitary piece of corrugated board that is die-cut and scored to form an elongate, rectangular center panel 30 that forms the bottom wall 15 in the erected box. First side wall panels 31 and 32 are foldably joined to opposite side edges of the bottom-forming panel 30, and define the bottom side wall segments 24 in the erected box. End-wall-forming panels 33 and 34 are foldably joined to opposite ends of the bottom-forming panel 30, and a second side wall panel 35 is foldably joined along one edge of each panel 33 and 34 to form the narrow first side wall segments 25 in the erected box. Relatively wider third side wall panels 36 and 37 are foldably joined along one edge to the opposite side edges of the panels 33 and 34, and form the second, wider side wall segments 26 in the erected box. Corner panel-forming panels 38 and 39 of greater width than the panels 36 and 37 but narrower than panels 30-34 are foldably joined along one edge to the panels 36 and 37 and form the angled interior corner panels in the erected box. Narrow flaps 40 and 41 are foldably joined to the opposite edges of panels 38 and 39 and form the glue flaps 28. In the erected box, the glue flaps 28 are adhesively secured to an interior surface of the adjacent end wall, and the flaps 31 and 32 are folded upwardly and glued to an outer surface of the respective side end wall segments 25 and 26.

It will be noted that a continuous score 42 extends along the length of the blank at opposite sides of the bottom-wall-forming panel 30 and the end-wall-forming panels 33 and 34, and in the particular example shown, short cuts 43 are spaced along these scores. Further, in the particular example shown, the scores 44 separating the panels 36 and 38 and the panels 37 and 39, and the scores 45 separating the panels 38 and 40 and the panels 39 and 41 comprise lines of perforations 46. It should be understood, however, that the cuts and perforations need not be employed and the scores could comprise creased areas.

As indicated in figure 11, the containers **C** may be inverted and placed upside down in the box 14, where they are retained by the angled corner panels 20 and 21, the bottom side wall segment 24 and the narrow side wall segment 25. This feature enables the container manufacturer to place empty containers in the box for shipment to a facility where the containers are to be filled.

A blank **B<sub>5</sub>** for forming the triangular corner inserts **71** and **72** is shown in figure 18 and comprises first, second and third panels **86**, **87** and **88** joined along scores **89**.

In figure 19 a plurality of containers **C'** of square cross-section are shown placed in the box **14** of figures 8-11. This capability exists for all embodiments of the invention. This figure also clearly shows how the containers are retained in place in the box in spite of the large openings through the side walls.

A sixth embodiment of the box of the invention is shown at **90** in figure 20. This embodiment is similar to the embodiment of figure 8, except the panels **91** and **92** foldably joined to opposite side edges of the bottom-forming panel **30** have a width to extend the full height of the box, and shaped cut-outs **93** are formed in them to provide the openings through which the containers are visible. This arrangement also produces a double thickness side wall **94** in the area between the respective angled interior corner panels **20** and **21** and the adjacent end walls.

A blank **B<sub>6</sub>** for forming the box **90** is shown in figure 21. This blank is the same as the blank **B<sub>1</sub>** shown in figure 9, except for the panels **91** and **92** and the cut-outs **93** in these panels.

A seventh embodiment **100** is shown in figures 22 and 23, and is similar to the embodiment shown in figures 4 and 5, except in this embodiment the side walls **101** and end walls **102** have a height greater than the height of containers **C** placed in the box, and a cut-out **103** is formed in one end wall.

While particular embodiments of the invention have been illustrated and described in detail herein, it should be understood that various changes and modifications may be made to the invention without departing from the spirit and intent of the invention as defined by the scope of the appended claims.

WHAT IS CLAIMED IS:

5           angled interior corner panels extending across two diagonally opposite  
corners of the box, defining a generally parallelogram-shaped interior space in the  
box, whereby a number of containers can be placed in the box in nested, offset  
relationship to one another in a parallelogram-shaped arrangement that conforms  
closely to the interior shape of the box, said elongate rectangular shape of the box  
10           enabling the boxes to be cross-stacked and interlocked with one another to produce  
a stable stack of the boxes.

(6.) A box as claimed in claim 5, wherein:

the side and end walls and interior corner panels have a height that is at  
least as great as the height of containers placed in the box, whereby boxes filled  
with containers may be stacked on top of one another without imposing a load on  
5           the containers, said interior corner panels serving to impart stacking strength to the  
box as well as defining said parallelogram-shaped interior space that conforms  
closely to the parallelogram-shaped arrangement of containers placed therein.

(7.) A box as claimed in claim 6, wherein:

at least a portion of at least one said side wall is of reduced height, defining  
an opening through said at least one side wall, whereby containers placed in the  
box are visible through the opening.

(8.) A box as claimed in claim 7, wherein:

at least portions of both side walls are of reduced height, defining openings  
through which containers placed in the box are visible, and said interior corner  
panels are cut from said side walls to form said openings, said corner panels having  
one edge foldably connected to a respective side wall, and an opposite free edge,  
5           said corner panels being folded back from a respective side wall and attached at  
their free edge to an adjacent end wall.

15 a corner panel-forming panel foldably connected along one edge to a second edge, opposite said first edge, of each of the third side wall panels, said corner panel-forming panel having an opposite free edge.

(14.) A blank as claimed in claim 13, wherein:

said first and second side wall panels are narrow, said third side wall panels are wider than said first and second side wall panels, and said corner panel-forming panels are wider than said third side wall panels.

(15.) A blank as claimed in claim 13, wherein:

said first side wall panels are wider than said second and third side wall panels, and in an erected box extend approximately one-half the height of the box.

(16.) A blank as claimed in claim 13, wherein:

said first side wall panels are wider than said second and third side wall panels, and in an erected box extend the full height of the box.

(17.) A blank as claimed in claim 16, wherein:

the edge of each said first side wall panel opposite its folded connection with the center panel has a cut-out to define an opening extending over a substantial portion of the side wall in an erected box.

(18.) A blank as claimed in claim 14, wherein:

a glue flap is foldably connected to the free edge of said corner panel-forming panel to secure the free edge to an adjacent end wall in an erected box.

~~19.~~ A method of packaging containers in boxes to optimize utilization of pallet space on which said boxes are stacked, and to enable the boxes to be cross-stacked and interlocked with one another to produce a stable stack, comprising the steps of:  
providing a box having an elongate rectangular shape with side walls and end walls disposed orthogonally to one another; and



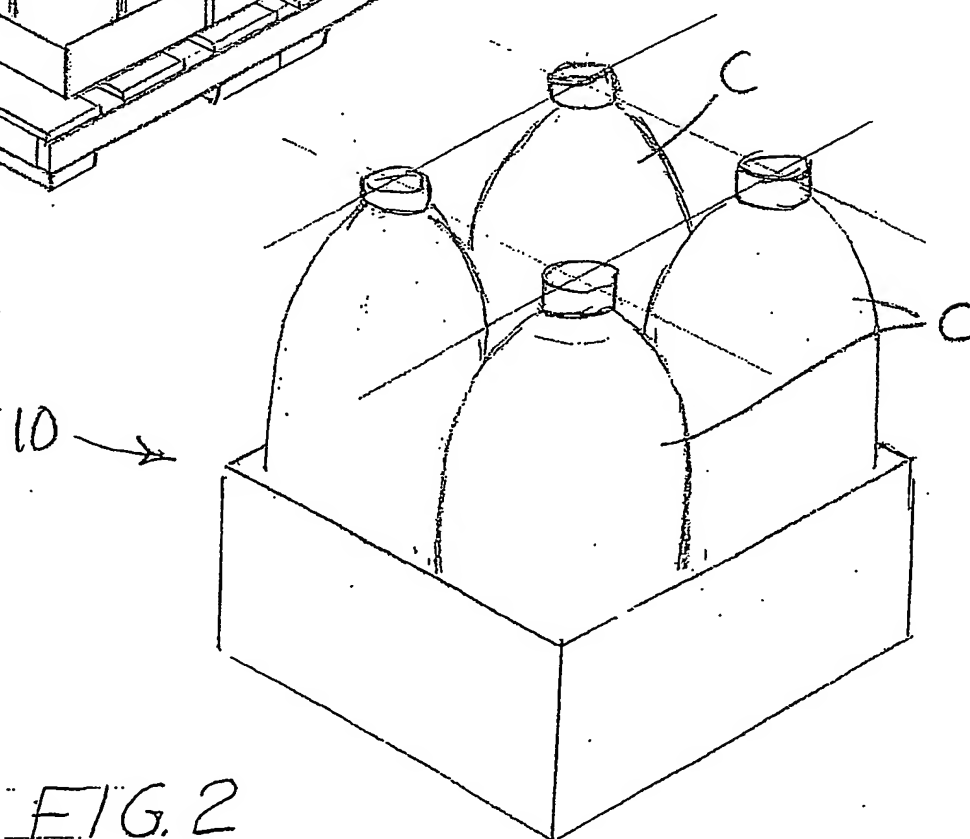
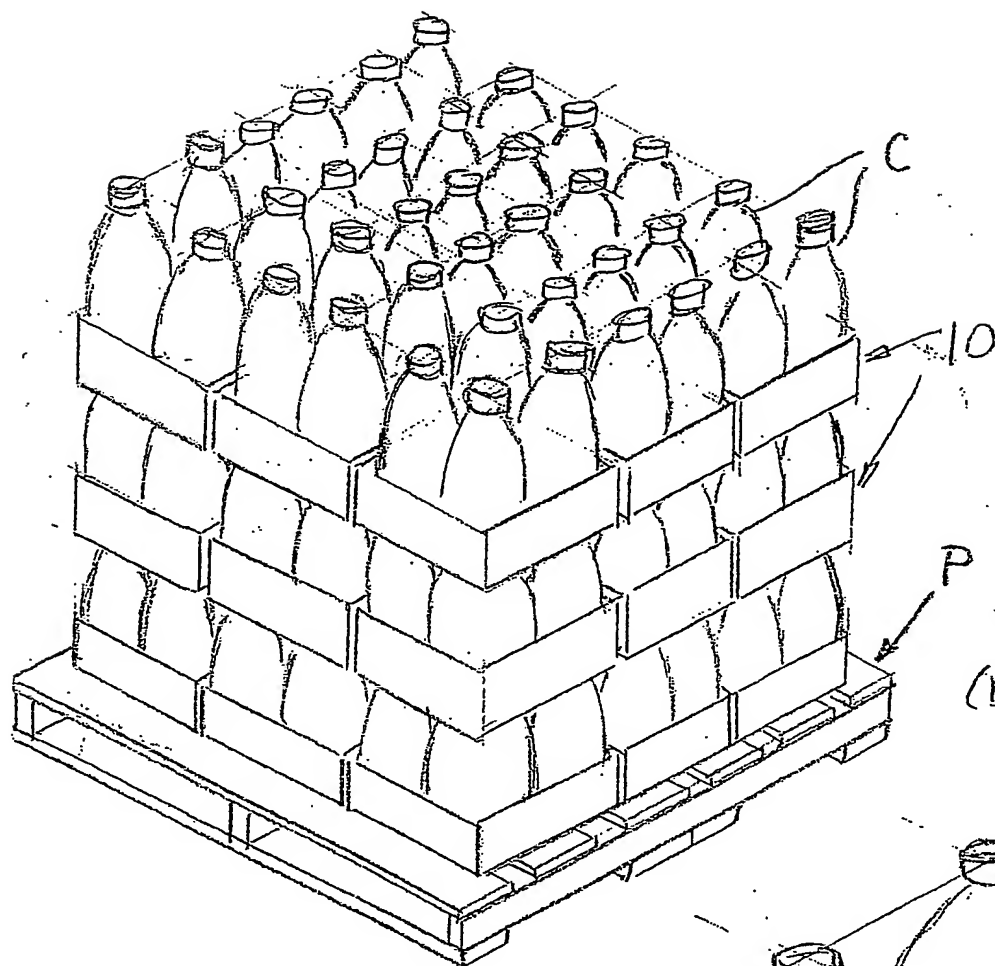
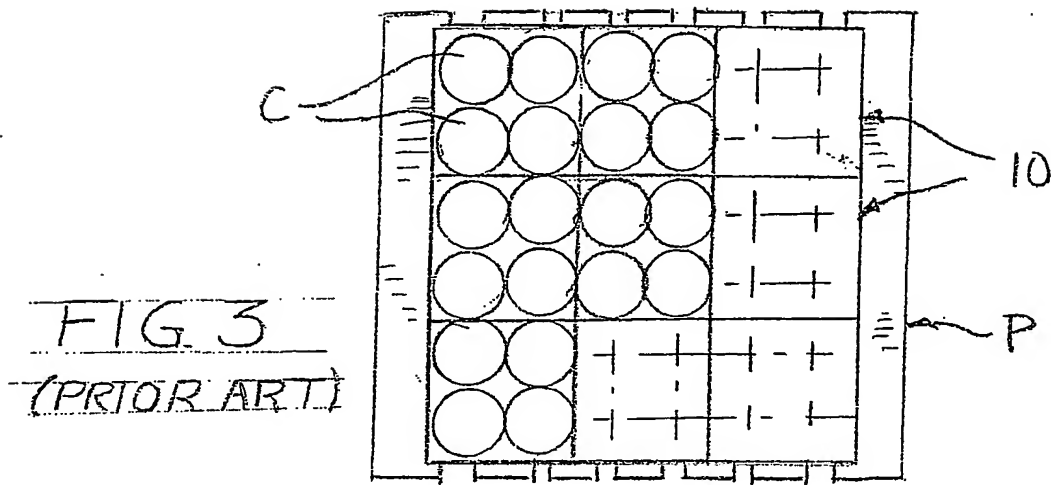
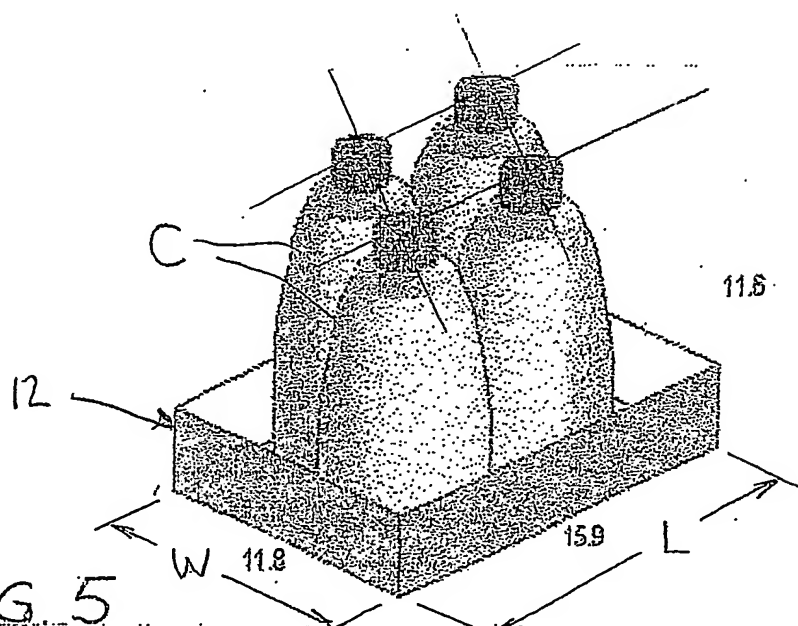
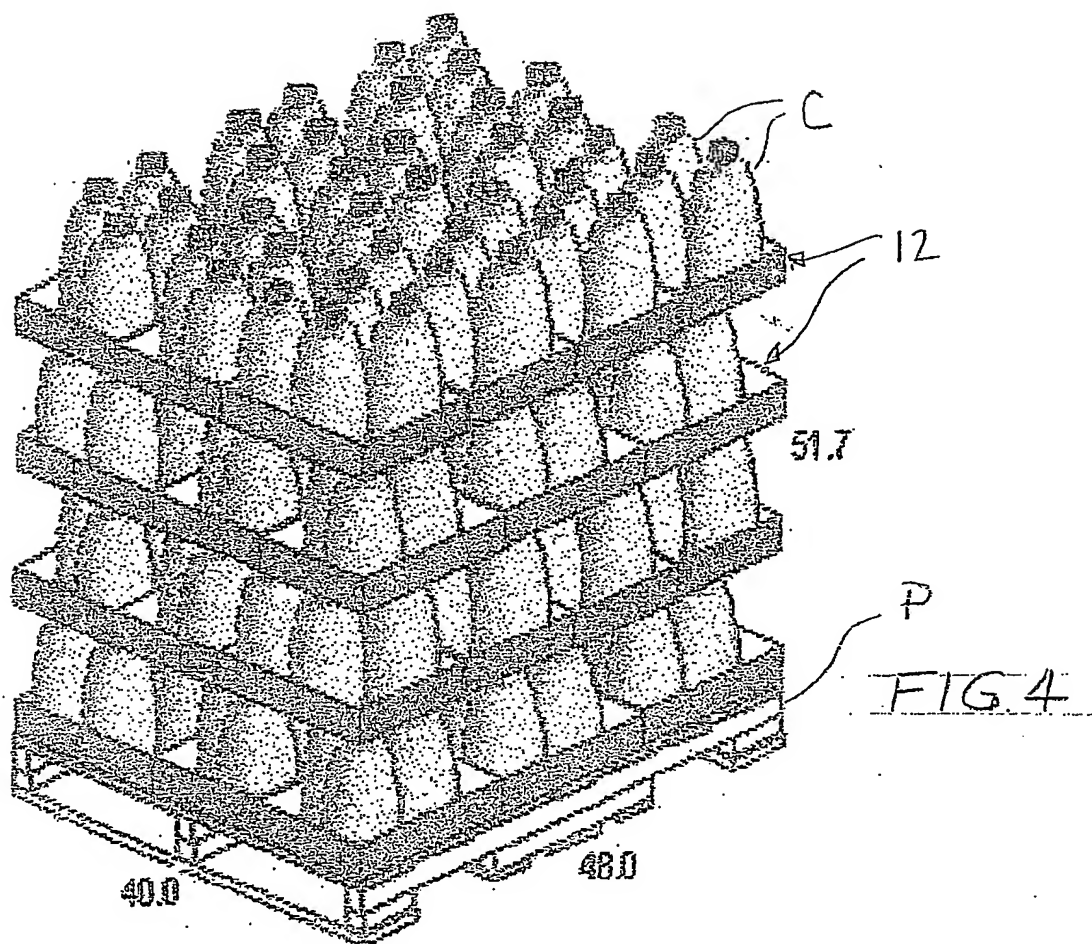


FIG. 2  
(PRIOR ART)





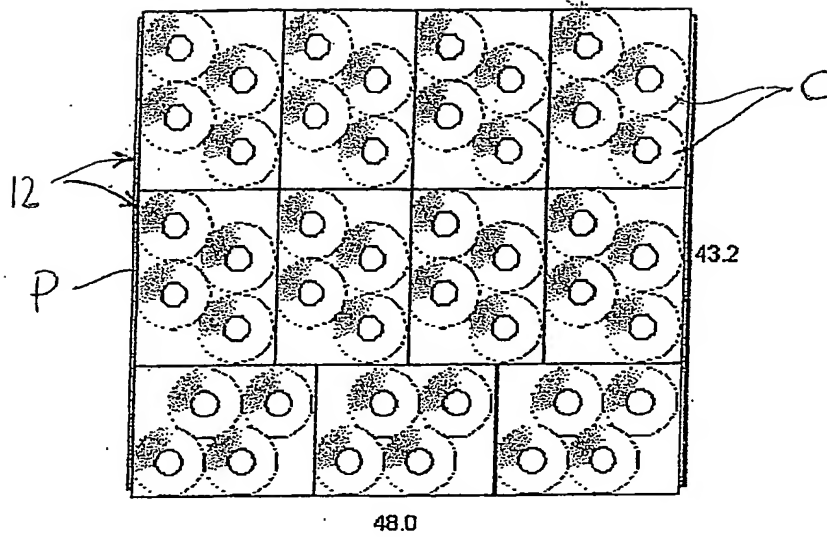
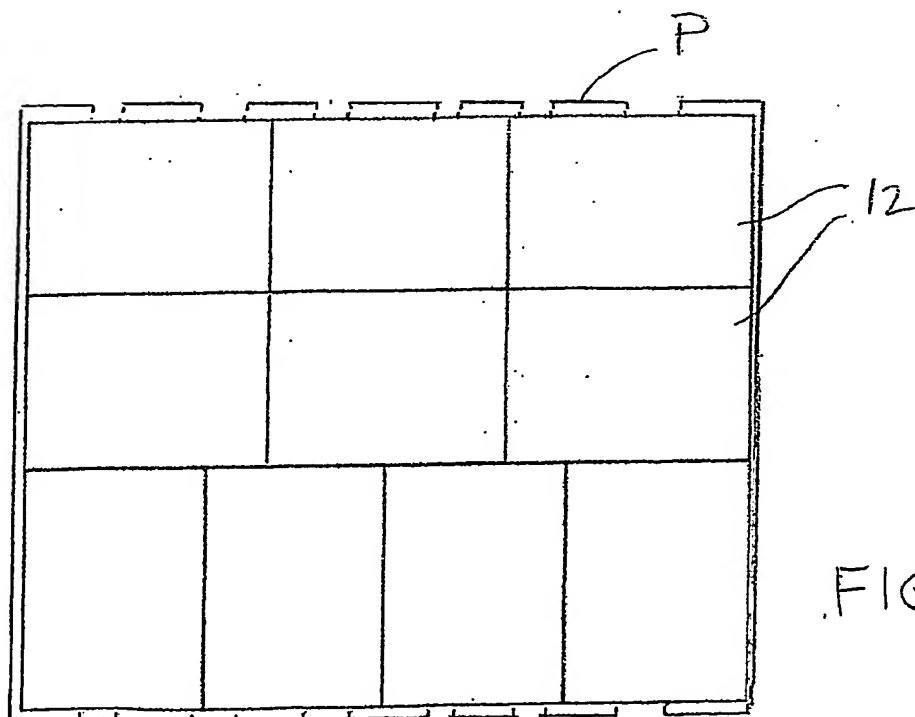
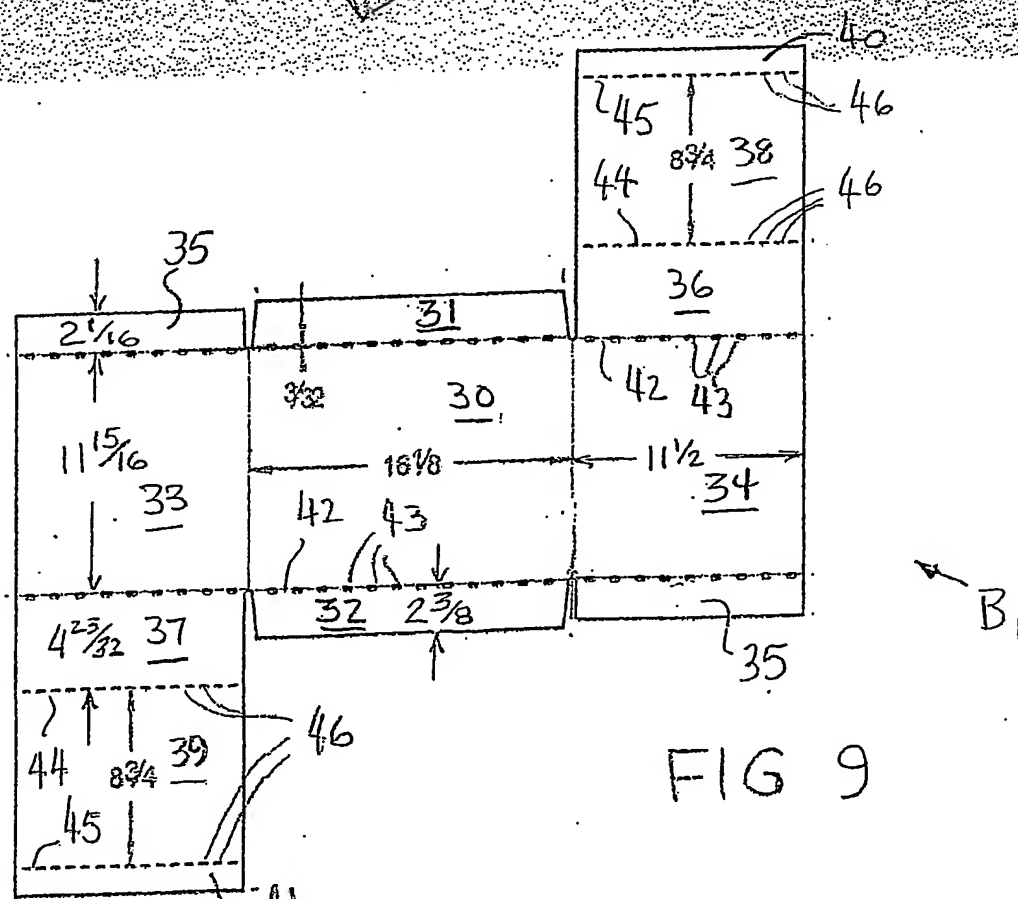
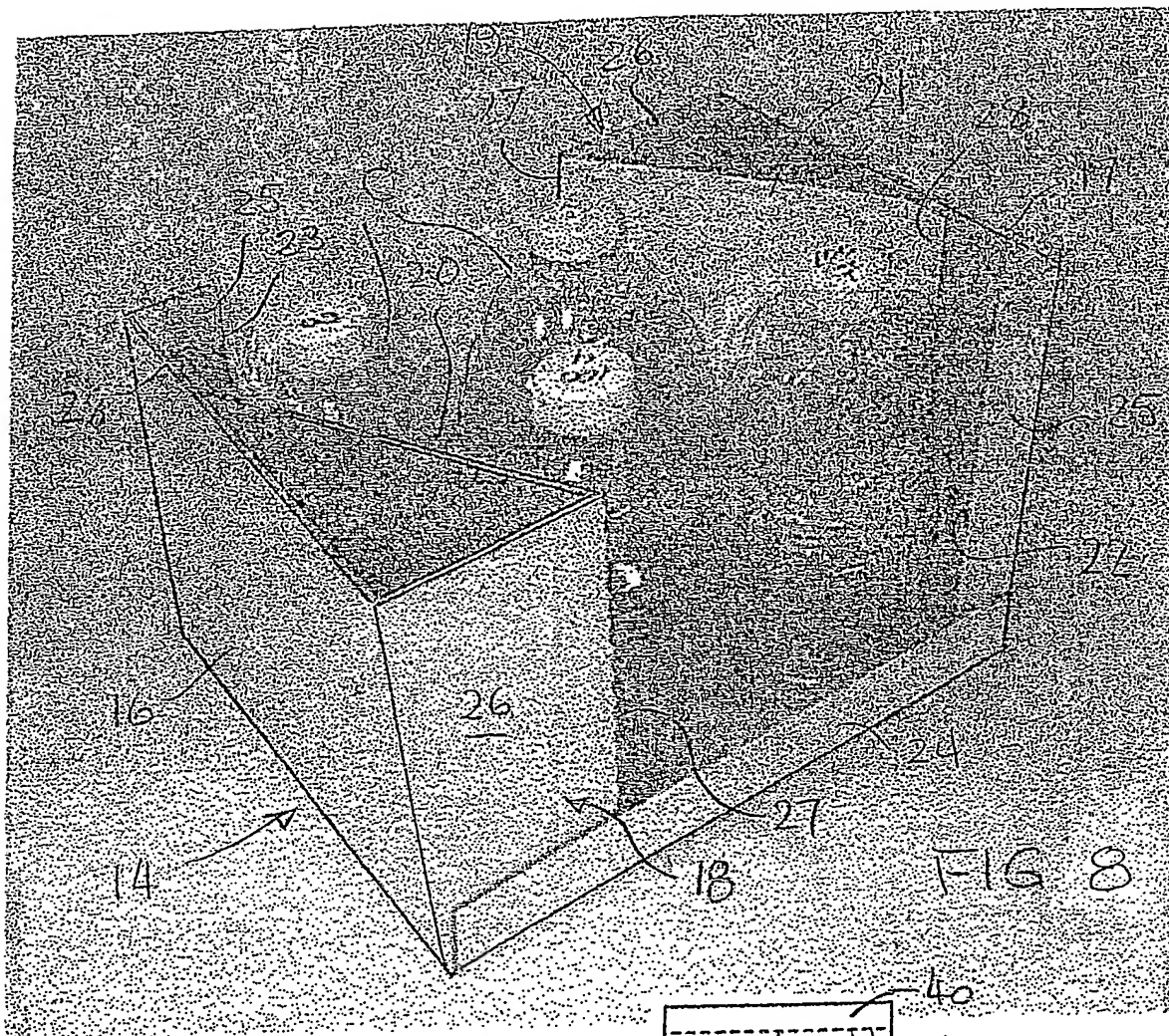
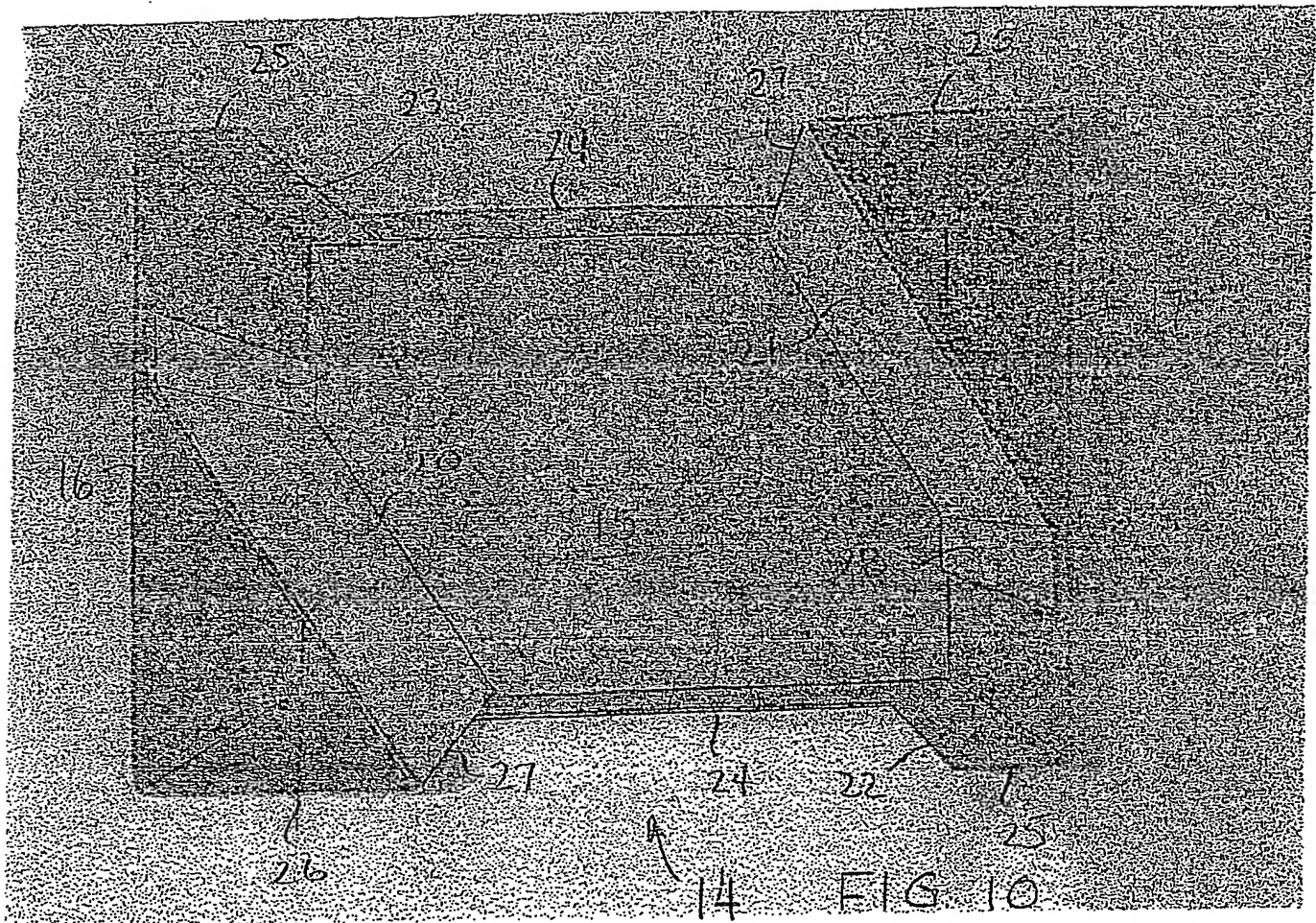


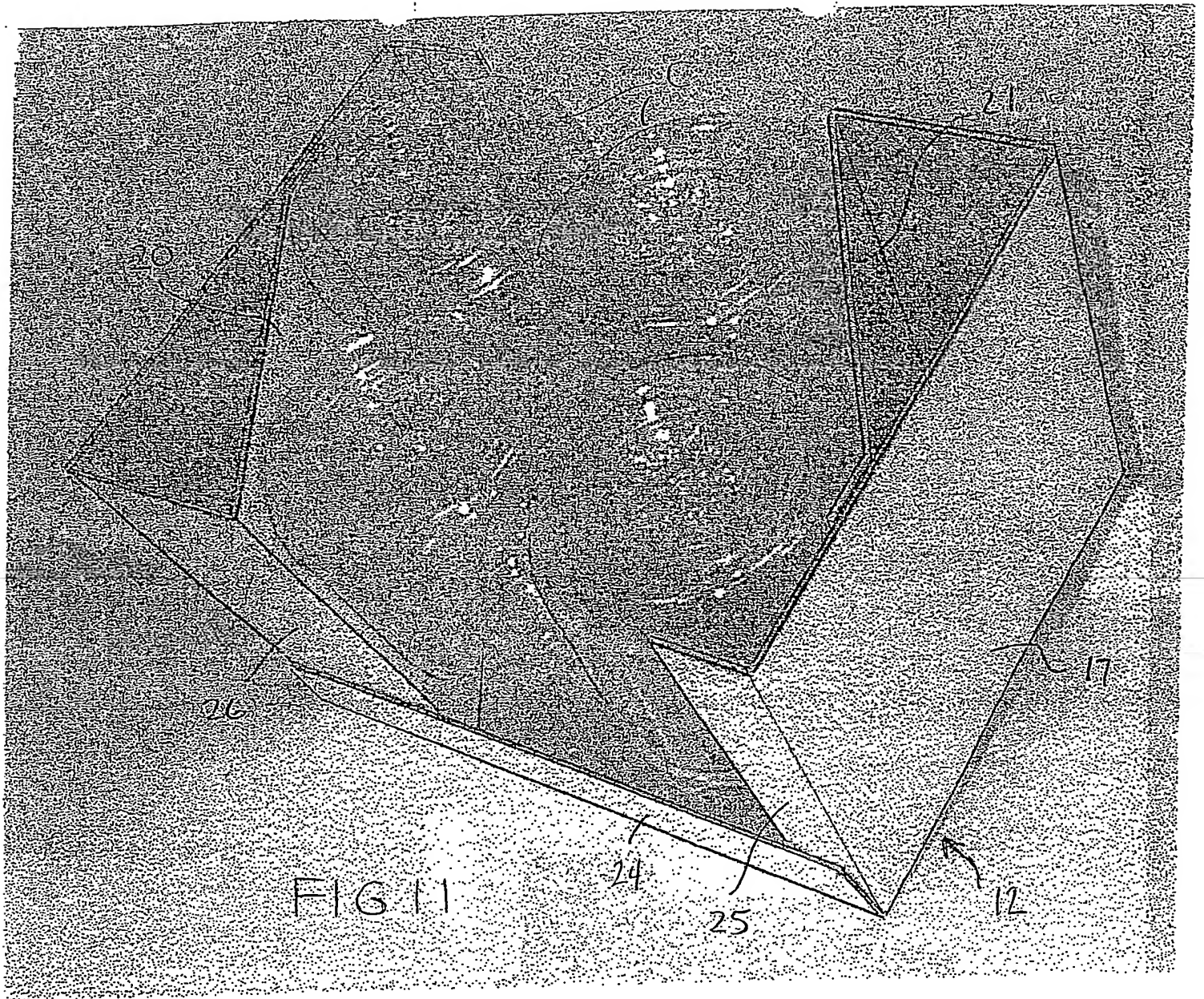
FIG 6

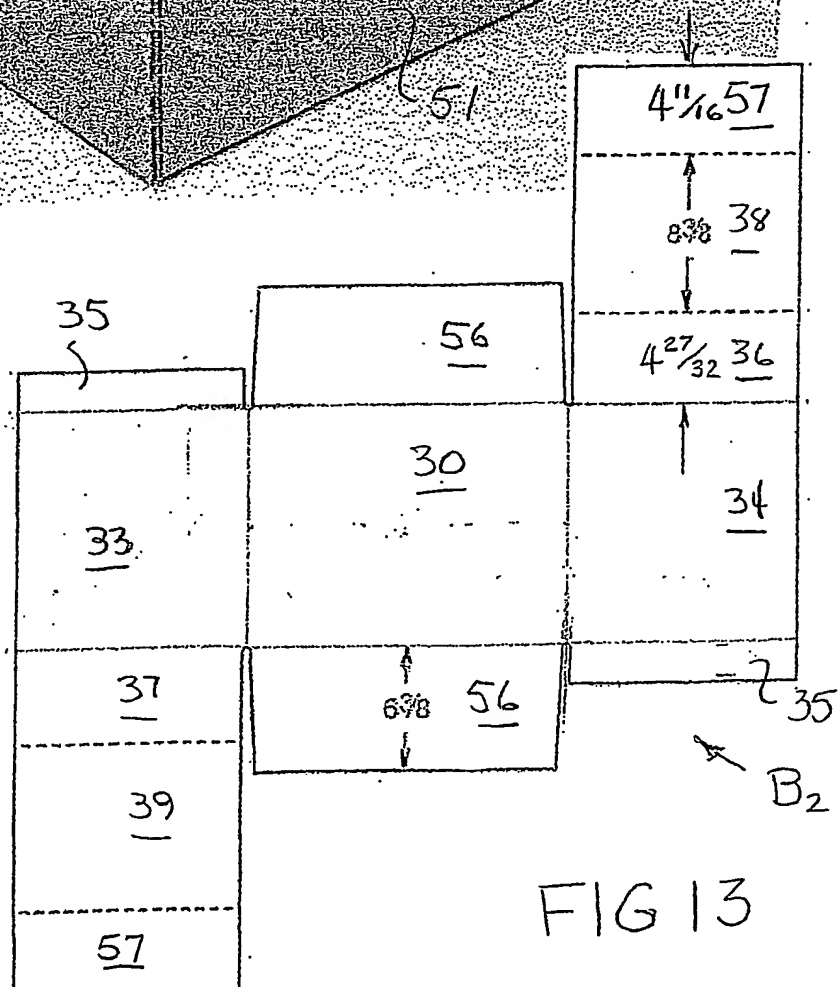
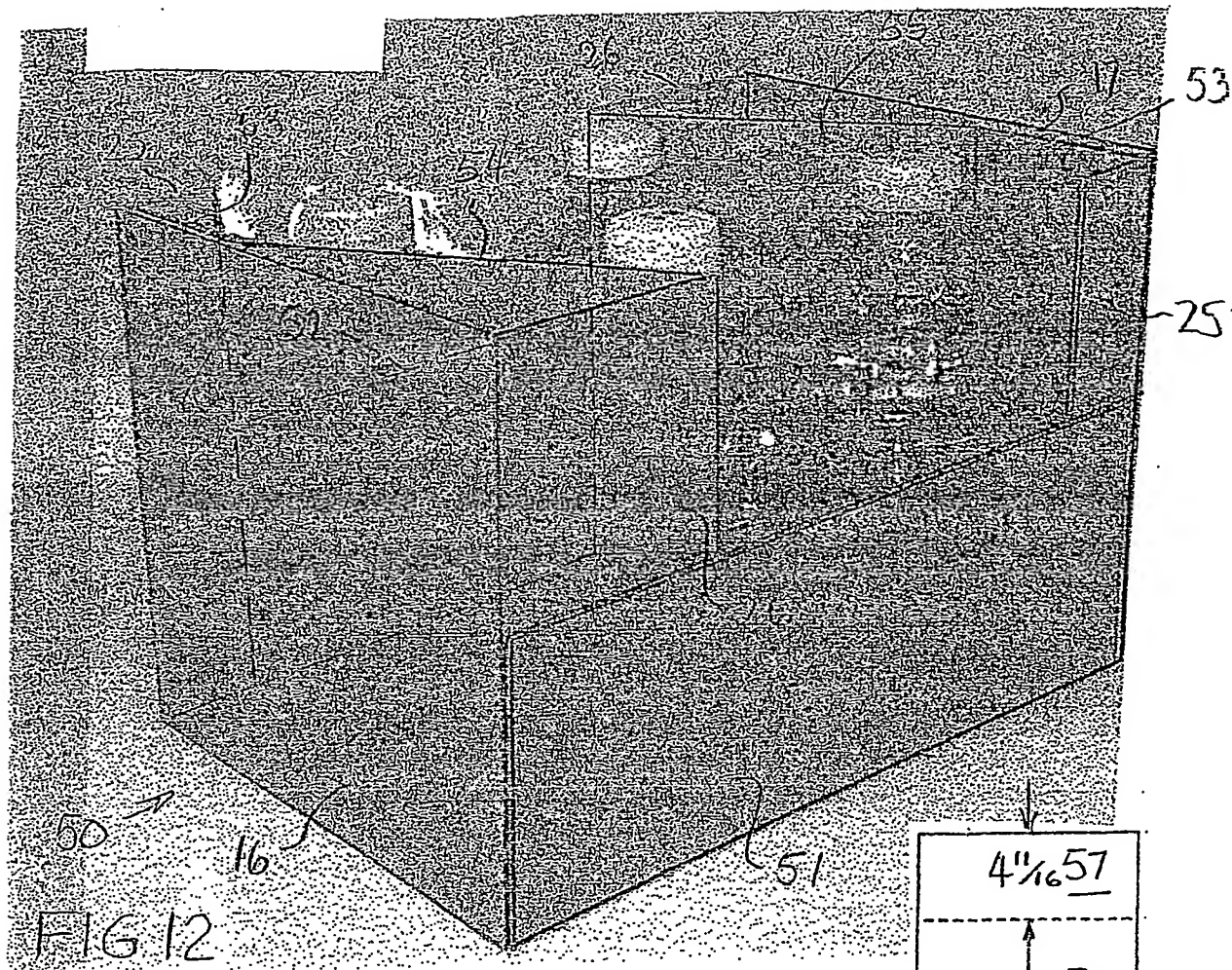




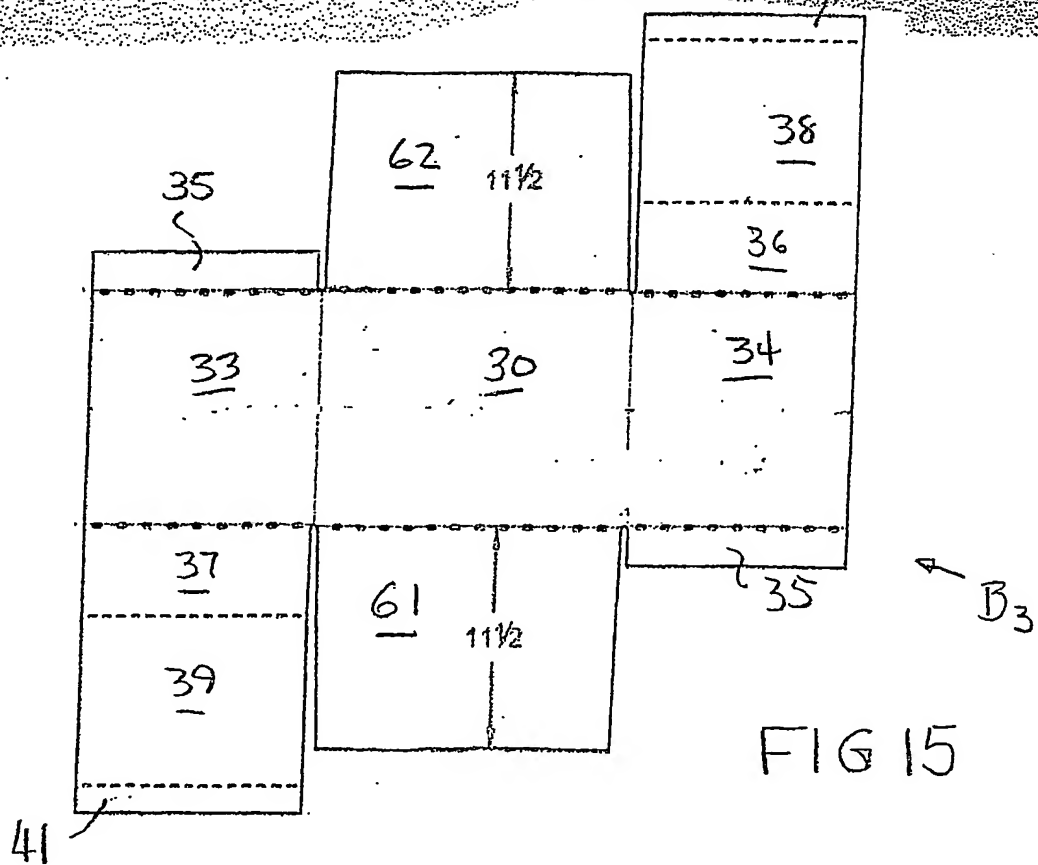
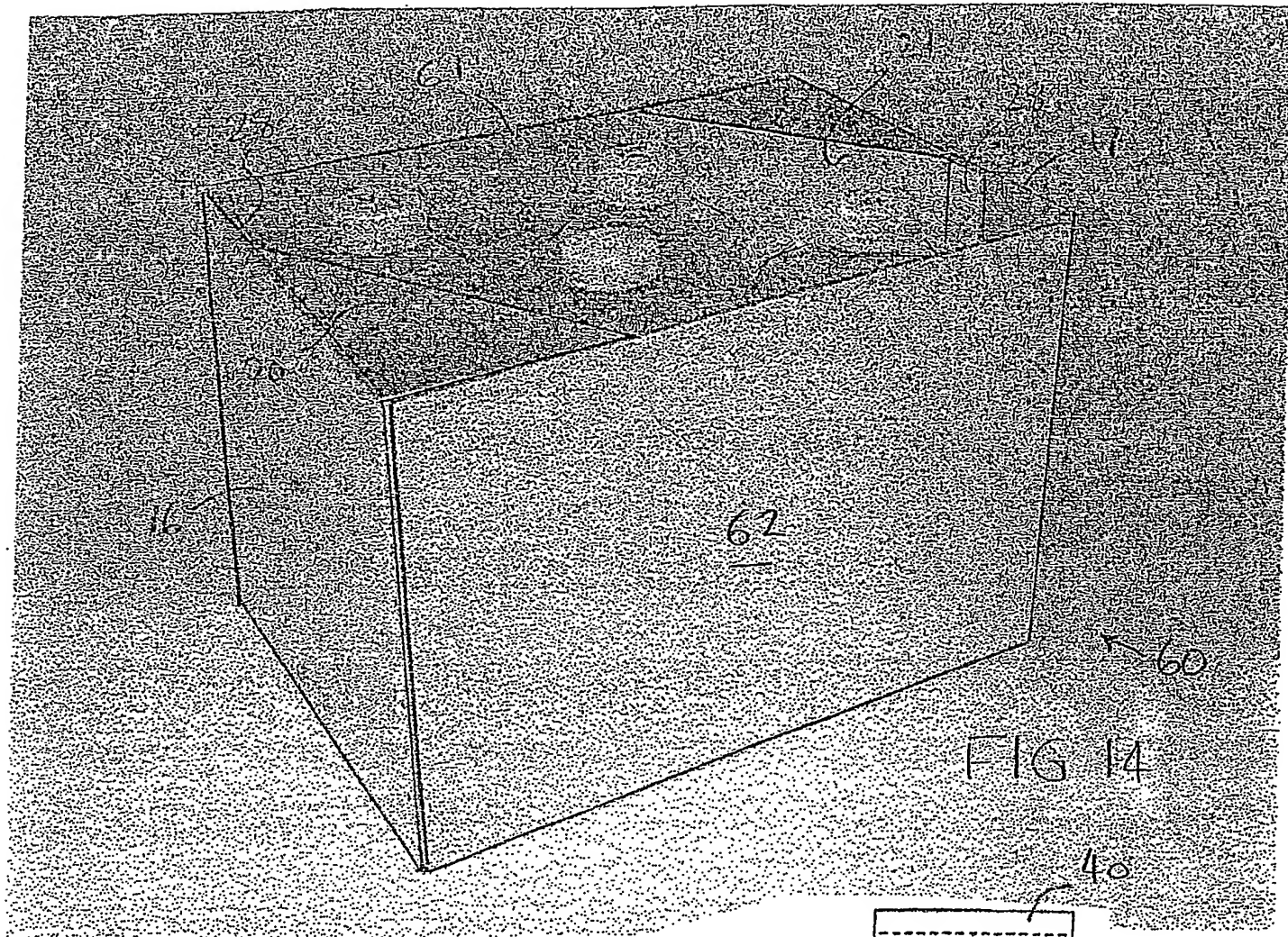


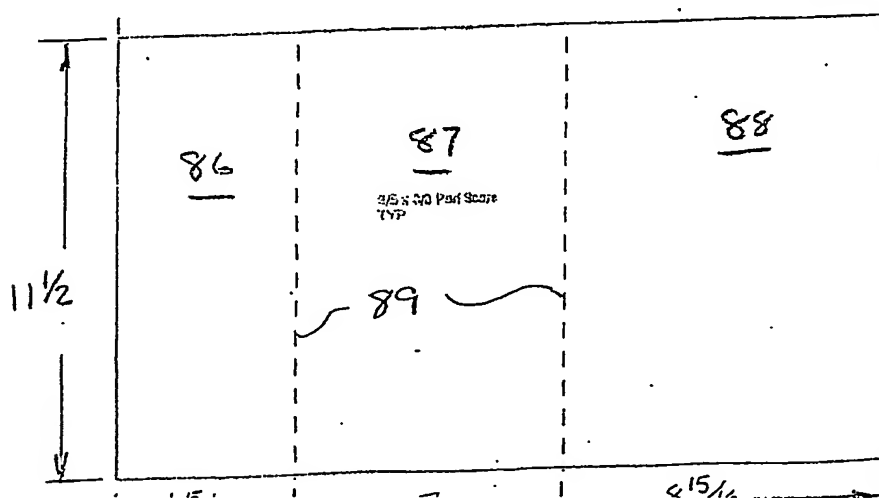
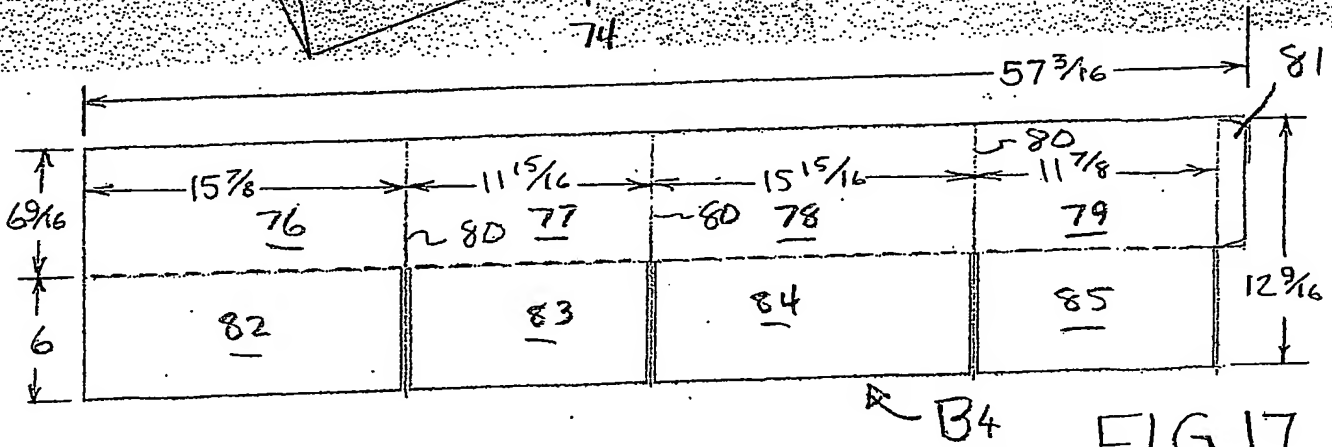
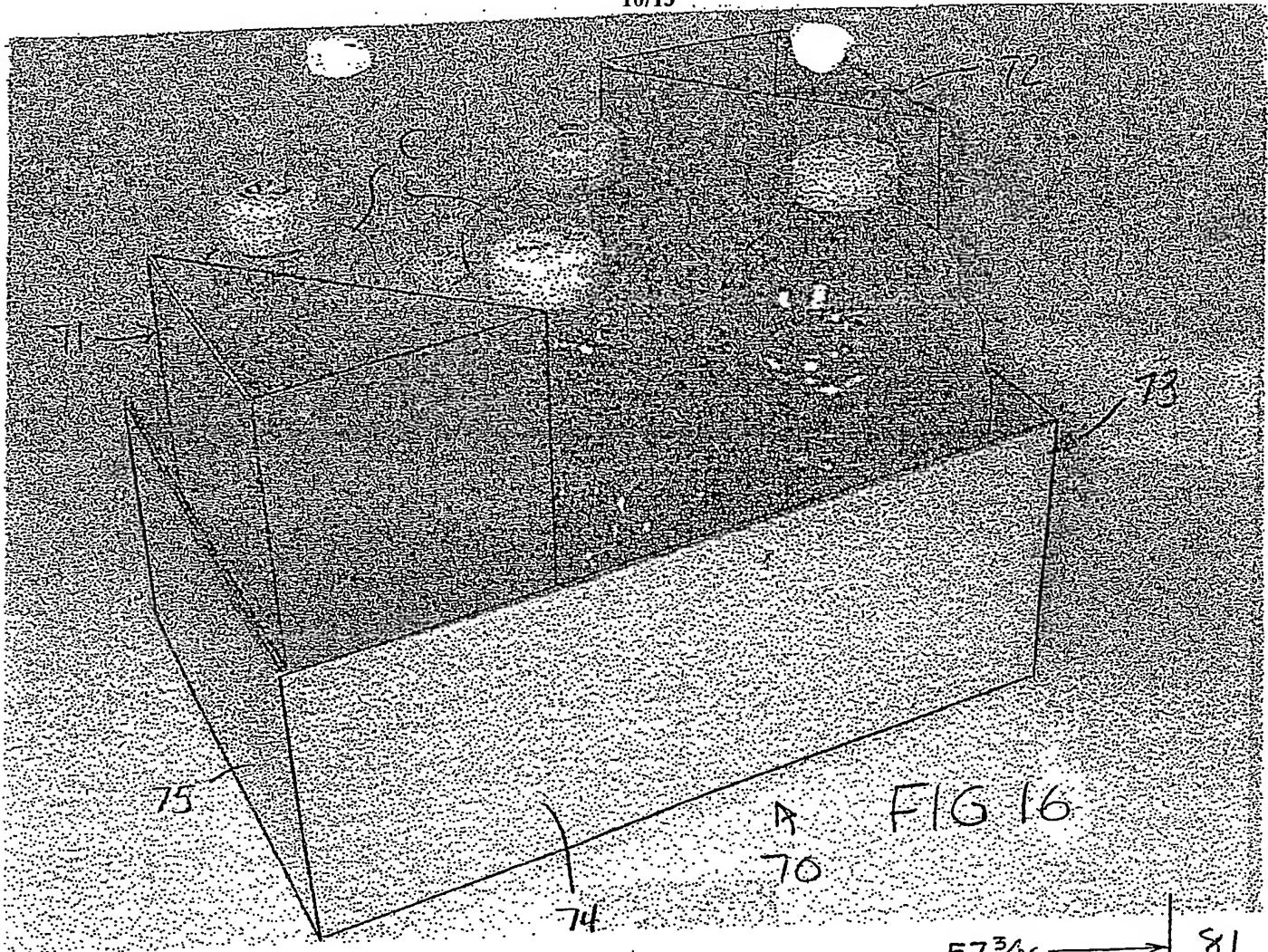












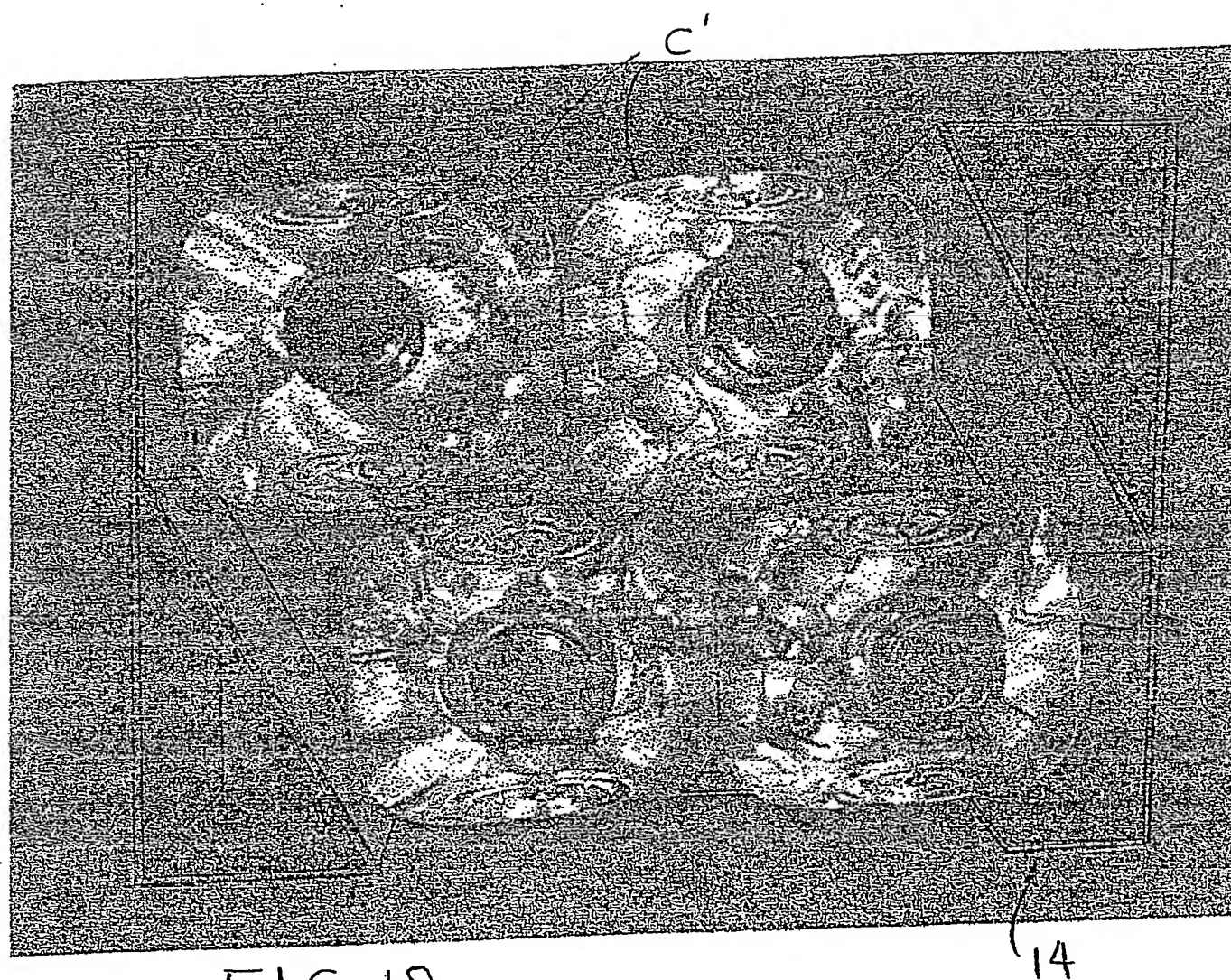


FIG 19



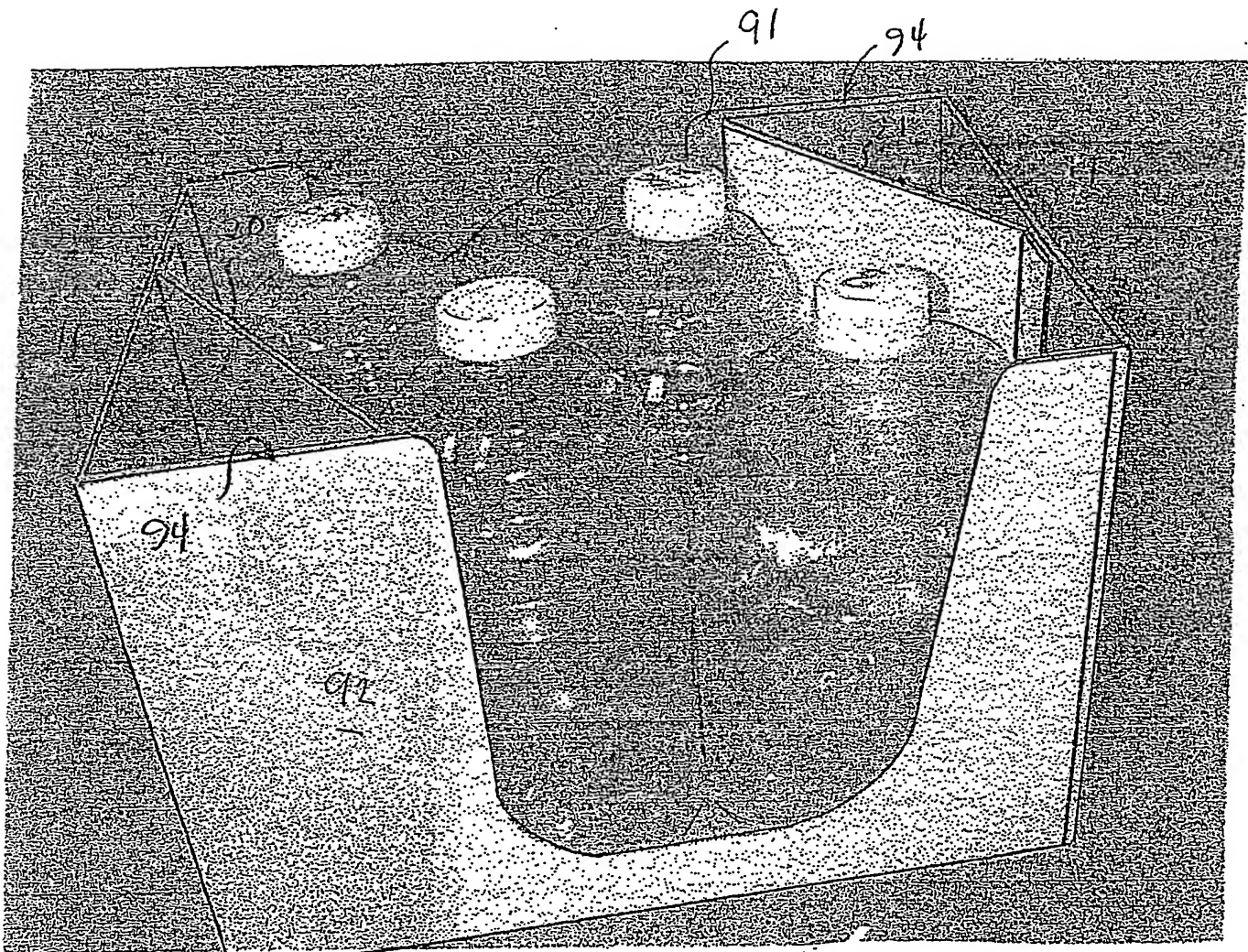
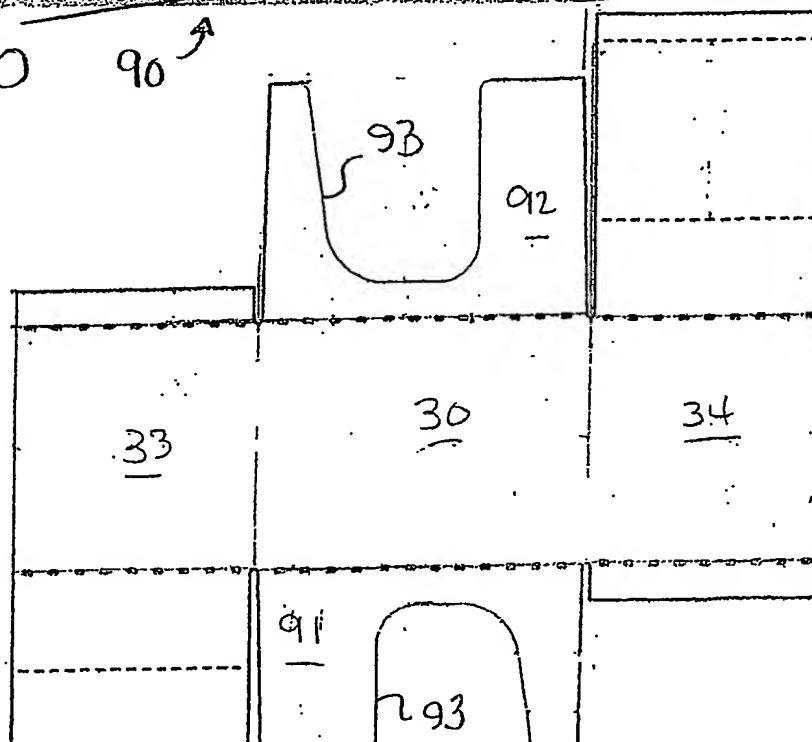


FIG 20 90° ↗

B6 →

FIG 21



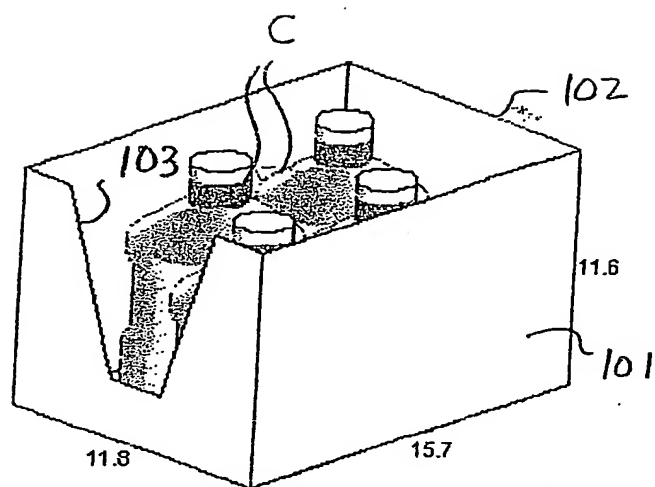


FIG 22

100 →

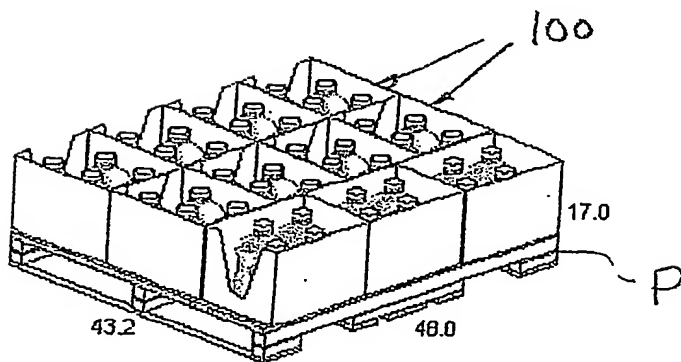


FIG 23

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